

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1. (Currently Amended) A continuous process for the manufacture of methylmercaptan comprising contacting in a reactor an intimate mixture of carbon oxides, sulfur or hydrogen sulfide and hydrogen as reactants in a proportion of 1/0/1/0 to 1/10/10/10 at elevated temperature of from 300 - 450°C and pressure of at least 4 bar and total gas hourly space velocity of 750 - 3000 h⁻¹ over a preformed solid catalyst comprising an active component of Mo-O-K-based species, an active promoter which is a mixture of oxides or sulfides or sulfides and oxides of an element M wherein M is selected from the group consisting of iron, cobalt, nickel, lanthanum, cerium and manganese, and the oxides have the formula M_xO_y where x and y are integers from 1 to 5 and, optionally, a carrier;

wherein the catalyst K₂MoO₄/M_xO_y/carrier has a weight ratio of contents equal to 0.01-0.80/0.01-0.10/1, when the active component is expressed by K₂MoO₄; or the catalyst MoO₃/K₂O/M_xO_y/carrier has a weight ratio of contents equal to 0.10-0.50/0.10-0.30/0.01-0.10/1, when the active component is expressed by MoO₃ and K₂O.

~~wherein an unreacted gas containing said intimate mixture is recycled to a feed gas stream in the process;~~

~~and further, wherein the gas to be recycled is separated from all by-products which are liquid at 0-5°C and ambient pressure, and wherein the recycled gas is catalytically converted so as to only consist of carbon oxides, hydrogen and hydrogen sulfide.~~

2. (Original) Process according to claim 1, wherein the active component is a Mo-O-K-based species, its precursor are oxides of molybdenum.
3. (Original) Process according to claim 2, wherein the active component is a potassium molybdate or ammonium heptamolybdate (NH₄)₆Mo₇O₂₄ plus a potassium salt or molybdenum oxide plus a potassium salt.

4. (Previously Presented) Process according to claim 3, wherein the weight ratio of K_2MoO_4 /carrier is from 0.01-0.80/1, when the active component is expressed by the amount of K_2MoO_4 ; or the weight ratio of MoO_3/K_2O /carrier is 0.01-0.80/0.01-0.50/1, when the active component is expressed by the amount of MoO_3 and K_2O .

5. (Previously Presented) Process according to claim 1, wherein the active component of the catalyst is impregnated or coated onto the carrier by multi-step impregnation applied to the surface of the support or coating of the support with the active component.

6.-7. (Cancelled)

8. (Currently Amended) Process according to claim [[7]] 1, unreacted gas containing said intimate mixture is recycled to a feed gas stream in the process and wherein the gas to be recycled is separated from all by-products which are liquid at 0-5°C and ambient pressure, and wherein the recycled gas is catalytically converted so as to only consist of carbon oxides, hydrogen and hydrogen sulfide.

9. (Previously Presented) Process according to claim 1, wherein selectivity of each of by-products methane, dimethylsulfide and carbon bisulfide is not higher than 1%.

10.-11. (Cancelled)

12. (Previously Presented) Process according to claim 1, wherein total selectivity of methylmercaptan is increased by at least 1.5% by decreasing total gas hourly space velocity by 75%.

13. (Original) Process according to claim 1, wherein the carrier is silica.

14 -17. (Cancelled)

18. (Previously Presented) Process according to claim 1, wherein the active promoter is a sulfide, produced by sulfurizing with hydrogen sulfide prior to the reaction.

19. (Previously Presented) Process according to claim 1, wherein the Mo-O-K has a potassium component which is derived from the group consisting of potassium acetate,

potassium oxalate, potassium hydroxide, potassium carbonate, potassium nitrate, and potassium bicarbonate.

20. (Previously Presented) Process according to claim 1, wherein the catalyst is prepared by multi-step impregnation when K_2MoO_4 , MoO_3 or $(NH_4)_6Mo_7O_{24}$ plus a potassium salt is employed as precursor of the active component.

21. (Original) Process according to claim 20, wherein impregnation is performed by using potassium salts selected from the group consisting of potassium acetate, potassium oxalate, potassium hydroxide, potassium carbonate, potassium nitrate, and potassium bicarbonate, and oxides or sulfides selected from the group consisting of molybdenum, iron, cobalt, nickel, lanthanum, cerium and manganese.

22.-24. (Cancelled)

25. (Previously Presented) Process of claim 6, which is carried out in a fixed catalyst bed arrangement or in a fluidized bed to aid in reactor temperature control of an exothermic reaction.

26. (Previously Presented) Process according to claim 1, wherein a series of fixed catalyst beds or a reactor comprising one or multiple ($n = 1 - 10$) reaction zones is used, in which one or more of the reactants can be fed between the reaction zones.

27. (Original) Process according to claim 1, wherein the catalyst may be arranged in fixed beds with intermediate gas injection or multitubular reactors for a better temperature control.

28. (Previously Presented) Process according claim 26, wherein hydrogen, hydrogen sulfide, synthesis gas, and/or carbon oxides are fed to the mixture between the reaction zones.

29. (Cancelled)

30. (Previously Presented) Process according to claim 1, wherein the unreacted gas is directed over a catalyst bed for the conversion of by-products before being recycled to the feed gas stream.

31. (Previously Presented) Process according to claim 30, wherein the by-products are carbonyl sulfide, carbon disulfide, and/or dimethylsulfide.

32. (Original) Process according to claim 30, wherein by-products are catalytically converted to carbon dioxide, methylmercaptan and hydrogen sulfide before recycling them to the feed gas stream.

33. (Withdrawn) A process for preparing a solid, preformed catalyst system comprising the steps of

I) preparing an impregnation liquid of an aqueous solution of a salt of a transition metal or rare-earth metal and a precursor of K_2MoO_4 or $(NH_4)_6Mo_7O_{24}$ plus a potassium salt or MoO_3 plus a potassium salt; and

II) impregnating a suitable carrier with such impregnation liquid, followed by drying the intermediate produced, and calcinating such intermediate to obtain the catalyst.

34. (Withdrawn) A process for preparing a solid, preformed catalyst system comprising the steps of

A) preparing an impregnation liquid of an aqueous solution of a salt of a transition metal or rare-earth metal;

B) impregnating a suitable carrier with such impregnation liquid, followed by drying the intermediate produced, optionally calcinating such intermediate;

C) preparing an aqueous steeping solution of a precursor of K_2MoO_4 or $(NH_4)_6Mo_7O_{24}$ plus a potassium salt or MoO_3 plus a potassium salt; and

D) steeping the intermediate produced in (B) with the aqueous steeping solution produced in (C) and then drying and calcinating the resultant catalyst.

35. (Withdrawn) Process according to claim 33, wherein the impregnation liquid and/or the steeping solution is treated with alkyl amides, or an organic acid containing at least one carbon atom and at least one acid function.

36. (Withdrawn) Process according to claim 35, wherein the alkyl amide is dimethylformamide or dimethyl acetamide, and the organic acid is formic acid, acetic acid, propionic acid, butyric acid, pentanoic acid, hexanoic acid, acrylic acid, propionic acid,

vinylacetic acid, methacrylic acid, crotonic acid, 4-pentenoic acid, sorbonic acid, oxalic acid, malonic acid, succinic acid, maleic acid, 3-hydroxybutyric acid, glutaric acid, adipic acid, citric acid, tartaric acid or ethylene diamine-tetracetic acid.

37. (Withdrawn) Process according to claim 35, wherein the organic acid is citric acid.

38. (Withdrawn) Process according to claim 34, wherein the impregnation liquid and/or the steeping solution is treated with alkyl amides, or an organic acid containing at least one carbon atom and at least one acid function.

39. (Withdrawn) Process according to claim 34, wherein the alkyl amide is dimethylformamide or dimethyl acetamide, and the organic acid is formic acid, acetic acid, propionic acid, butyric acid, pentanoic acid, hexanoic acid, acrylic acid, propionic acid, vinylacetic acid, methacrylic acid, crotonic acid, 4-pentenoic acid, sorbonic acid, oxalic acid, malonic acid, succinic acid, maleic acid, 3-hydroxybutyric acid, glutaric acid, adipic acid, citric acid, tartaric acid or ethylene diamine-tetracetic acid.

40. (Withdrawn) Process according to claim 36, wherein the organic acid is citric acid.

41. (Currently Amended) A continuous process for the manufacture of methylmercaptan comprising contacting in a reactor an intimate mixture of carbon oxides, sulfur or hydrogen sulfide and hydrogen as reactants in a proportion of 1/0.1/0 to 1/10/10/10 at elevated temperature of from 300 - 450°C and pressure of at least 4 bar and total gas hourly space velocity of 750 - 3000 h⁻¹ over a preformed solid catalyst comprising an active component of Mo-O-K-based species, an active promoter which is a mixture of oxides or sulfides or sulfides and oxides of an element M wherein M is selected from the group consisting of molybdenum iron, cobalt, nickel, lanthanum, cerium and manganese, and the oxides have the formula M_xO_y where x and y are integers from 1 to 5 and, optionally, a carrier;

wherein the catalyst K_2MoO_4/M_xO_y /carrier has a weight ratio of contents equal to 0.01-0.80/0.01-0.10/1, when the active component is expressed by K_2MoO_4 ; or the catalyst $MoO_3/K_2O/M_xO_y$ /carrier has a weight ratio of contents equal to 0.10-0.50/0.10-0.30/0.01-0.10/1, when the active component is expressed by MoO_3 and K_2O ;

wherein an unreacted gas containing said intimate mixture is recycled to a feed gas stream in the process;

and further, wherein the gas to be recycled is separated from all by-products which are liquid at 0-5°C and ambient pressure, and wherein the recycled gas is catalytically converted so as to only consist of carbon oxides, hydrogen and hydrogen sulfide.